

VARNUM, RIDDERING, SCHMIDT & HOWLETT^{LLP}
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August 23, 1999

VIA OVERNIGHT MAIL



Mr. Jon Peterson
EPA Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 West Jackson Blvd.
Chicago, IL 60604

Re: Albion - Sheridan Township Landfill Superfund Site; Consent Decree;
Case No. 1:97-CV-1037

Dear Mr. Peterson:

This is to notify you that the City of Albion and Decker Manufacturing Corporation (the "Settling O&M Defendants") are proposing to substitute for SECOR as their "O&M Supervising Contractor" and "O&M Manager":

Mr. William Petruzzi
Senior Project Manager
HULL & ASSOCIATES, INC.
3401 Glendale Avenue
Suite 300
Toledo, Ohio 43614

Materials describing Hull's qualifications for the O&M Work are enclosed.

Leroy Schmidt, City Engineer, will continue as "Alternate O&M Supervising Contractor" and "O&M Inspector."

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We request that you issue a notice of approval and an authorization to proceed in accordance with Section VII, paragraph 17 of the Consent Decree. Upon such approval, the Notice provision in paragraph 118 of the Consent Decree will also be amended to substitute Hull & Associates for SECOR.

Please call me with any questions in this regard.

Very truly yours,

VARNUM, RIDDERING, SCHMIDT & HOWLETT_{LLP}



Charles M. Denton

/ah

Enclosure

cc (w/enc.): Mr. Leroy Schmidt
Mr. Philip M. Moilanen
Ms. Connie Puchalski, EPA-ORC
Mr. Francis J. Biros, DOJ

#331452

SECTION 3

STATEMENT OF QUALIFICATIONS

HAI is a full-service engineering and hydrogeological firm with significant professional consulting experience in assisting numerous public and private entities achieve environmental compliance. With offices in Cincinnati, Toledo, Columbus, and Cleveland, Ohio and Erie, Michigan, HAI provides comprehensive consulting services which include economic feasibility studies; contemporary landfill siting, permitting and design; environmental compliance monitoring programs; hydrogeological studies; remediation projects; geotechnical studies; construction contract preparation and administration; and construction quality control and quality assurance. Our professionals have significant experience in a variety of specialties in the fields of engineering, planning, public health and ecological studies, and provide services in virtually all areas of environmental management and compliance. Of especial significance for this proposal, HAI maintains the monitoring, analytic and reporting programs for dozens of landfills in many states in the Midwest and South.

3.1 Professional Consulting Services

- Solid Waste Facility Siting, Design and Closure Plans
- Landfill Gas Management Systems
- Solid Waste Management Planning
- Environmental Monitoring Programs
- Ecological Assessments
- Hydrogeological Investigations
- Drainage Studies
- Water Resources Studies and Design
- Public Water/Well Field Protection Studies
- Final Use Plans
- Land Use Plans
- Hazardous Materials Management
- Residuals Management
- Geotechnical Studies and Soils Testing
- Industrial Redevelopment/Brownfield
- Phase I/Phase II Environmental Site Assessments
- Public Health and Environmental Risk Assessments
- Site Remediation/RCRA Corrective Actions
- Environmental Compliance Audits
- Industrial Hygiene/Occupational Health and Safety
- Aboveground and Underground Storage Tank Management
- Geographic Information Systems (GIS) Support
- Litigation Support/Expert Witness Testimony
- Public Relations
- Economic Feasibility and Rate Studies
- Planning/Municipal Services
- Proposal/Grant Writing

3.2 Staff

Our professional staff provides a broad range of environmental consulting experience. The following represents the many disciplines employed by the firm:

- civil engineering
- environmental engineering
- geological engineering
- geotechnical engineering
- structural engineering
- biology and ecology
- construction inspection
- public health and safety
- computer services
- administrative support
- geology/hydrogeology
- geophysics
- Geographic Information Systems (GIS)
- laboratory and field testing services
- regulatory compliance
- governmental and public relations
- planning

3.3 Professional Licenses and Certifications

Professional Engineer's License (P.E.) (Michigan, Ohio, Pennsylvania, Indiana, Illinois, West Virginia, New Hampshire, Vermont, Connecticut, Kentucky, Texas, Massachusetts and Maine)

Registered Professional Geologists (Pennsylvania, Kentucky, North Carolina, Indiana, Tennessee, Georgia, Illinois)

Registered Underground Storage Tank Consultants (Michigan)

Certified Professionals (under Ohio's Voluntary Action Program)

Diplomat - American Academy of Environmental Engineers

Registered Environmental Professionals

Certified API Aboveground Storage Tank Inspector

Registered Sanitarian (Ohio)

Certified Asbestos Hazard Evaluation Specialist (Ohio)

Certified Asbestos Abatement Specialist (Ohio)

Certified Lead Inspector (Ohio)

Certified Wetland Delineator (U.S. Army Corps of Engineers)

VAP Certified Habitat and Fish Assessor (Ohio)

Pre-Qualified Environmental Services Consultant for the Ohio Department of Transportation

3.4 Professional Organizations and Community Involvement

National Solid Waste Management Association
Solid Waste Association of North America
American Academy of Environmental Engineers
American Society of Civil Engineers
American Chemical Society
American Institute of Professional Geologists
National Ground Water Association
Ohio EPA Divisions of Emergency & Remedial Response and Hazardous Waste Advisory Committee
Ohio Association of Environmental Engineers
Ohio County Commissioners' Association
Ohio Chamber of Commerce, Energy and Environment Committee
Michigan Chamber of Commerce, Environmental Quality Committee
Grand Rapids Chamber of Commerce
Ohio Brownfield Finance Partnership
Bureau of Underground Storage Tank Rule Development Committee (Ohio)
Ohio Manufacturers' Association Environmental Committee
Cincinnati Area Chamber of Commerce
Public Relations Society of America
Society of Marketing Professionals

3.5 Client References

Allied Waste Industries, Inc.

Phil Beal
250 64th Ave.
Coopersville, Michigan 49404
(616) 837-7316 ext. 11

Lyon C&C Landfill

Mr. Gene Klisiak
14800 P. Drive North
Marshall, MI
(616) 781-9742

Milliron Industries, Inc.

Noble Road Landfill, Inc. (former owner)
Grant Milliron
2384 State Route 39
Mansfield, Ohio 44903
(419) 747-6900

**Huron County Transfer Station
and Landfill**

Pete Welch, CPG
Manager
2415 Townline Rd. 131 West
Willard, Ohio 44890
(419) 744-2413

**Wyandot County Solid Waste
Management District**

Sue Bennett
P.O. Box 210
Upper Sandusky, Ohio 43351
(419) 396-3541

City of Wilmington

Linda Mitchell
Landfill Manager
Sanitation Department
397 South Nelson Ave.
Wilmington, Ohio 45177
(513) 382-6474

City of Toledo

Division of Solid Waste

Dave Leffler
2411 Albion Street
Toledo, Ohio 43606
(419) 936-2510

**Wood County Solid Waste
Management District**

Ken Rieman
440 East Poe Road, Suite 103
Bowling Green, Ohio 43402
(419) 354-9297

**Ashland County Solid Waste
Management District**

Mike Canfield
1270 Middle Rowsburg Road
Ashland, OH 44805
(419) 282-7382

City of St. Marys

Stan Davis
Water, Wastewater & Solid Waste
Departments
101 East Spring Street
St. Marys, OH 45885
(419) 394-4114

Browning Ferris Industries, Inc.

Jack Rowe
10690 6-Mile Rd.
Northville, MI
(810) 349-7230

Republic Environmental, Inc.

Mike Olds
2343 Alexandria Drive, Suite 400
Lexington, KY 40504
(606) 223-3824

3.6 Examples of Experience with NPL, Superfund, and State-Listed Sites

Operation, Maintenance, and Monitoring for State Superfund Site, Sanborn, New York

HAI performed operation, maintenance and monitoring for a soil and ground water remediation system at a state Superfund site in Sanborn, New York. The soil remediation system consisted of over 80 vapor extraction wells, 162 air injection wells, and a granular activated carbon (GAC) treatment system to treat the extracted vapors. The groundwater treatment system consisted of five groundwater extraction wells and a 650 gpm groundwater treatment system with GAC and air stripping towers. The treated groundwater was discharged to a nearby ditch under a stormwater discharge permit. HAI's full-time operator was responsible for system adjustments, maintenance and repairs, and environmental monitoring. HAI prepared monthly operating reports for the stormwater discharge and monthly operation, maintenance, and monitoring reports to track system performance and to comply with the state enforcement action.

Cardington Road Landfill Superfund Site, Moraine, Ohio

HAI was the lead engineering contractor for the remedial design at a 35-acre Superfund site. HAI provided key design components which included developing an optimal overall final grading plan for the landfill, identifying drainage patterns and mechanisms of discharge for surface water both during and after construction, sedimentation basin design, and defining components of the gas management system. HAI was responsible for preparation of detailed construction level drawings and technical specifications. HAI also provided geotechnical testing of soils used in construction and field documentation services during regrading of the site and deployment of the geomembrane/GCL cap. The Cardington Road Site Group realized significant cost savings due to HAI's efforts to optimize the regrading plan and our approach to cap configuration and construction.

Remedial Design at a Landfill Superfund Site, Confidential, Southwest Ohio

HAI is the lead engineering contractor for the remedial design at a landfill Superfund site. HAI provided key design components which included developing an optimal overall surface grading plan and slope of the landfill; identifying drainage patterns and mechanisms of discharge for surface water both during and after construction; and defining components of the gas management system. Specific tasks included: the development of a work plan; site mapping; preliminary designs; cap selection; grading and drainage plans; a gas management plan; a review of ARARs, institutional controls, and site facilities; soil cover investigations; and preliminary gas extraction field testing; and preparation of construction drawings and technical specifications.

Municipal Landfill Superfund Site, Confidential, South Central, Michigan

HAI conducted an evaluation of the RI/FS and proposed remedial alternatives for the site as part of an order issued by the U.S. EPA. The alternatives included removal of drums, active gas recovery system, landfill cap, and ground water monitoring. HAI evaluated the alternatives based on technical feasibility, system performance, and effectiveness of specific remedial alternatives. All of HAI's comments were incorporated into the final Record of Decision (ROD) issued by the U.S. EPA, including the use of a passive gas system versus an active system, resulting in substantial cost savings.

Reuse Design for the Stickney and Tyler Landfills, Toledo, Ohio

The Stickney and Tyler landfills were closed under the U.S. EPA Superfund Accelerated Cleanup Model program in 1998. HAI was hired in 1997 by the City of Toledo to analyze the current containment design and incorporate the dual goals of landfill closure and potential redevelopment. Closure plans were subsequently modified, submitted to U.S. EPA and approved. By modifying the closure design of these landfills, 75 acres of property are available for development within ¼-mile of the Daimler-Chrysler Jeep Assembly Plant.

PCB Contaminated Wetland Sediment/Record of Decision (ROD) Negotiations, South Municipal Water Supply Well Superfund Site, Peterborough, NH

In 1990, HAI was retained by New Hampshire Ball Bearings, Inc. as the prime consultant for the remedial design/remedial action at the South Municipal Water Supply Well Superfund Site. Contamination found at the site includes VOCs in the soil and ground water, and PCBs and polycyclic aromatic hydrocarbons (PAHs) in wetland sediments.

Wetland Sediment: PCBs and PAHs were present in wetland sediments near the manufacturing facility. The ROD originally required that a significant portion of the sediments be removed thereby destroying the wetlands and requiring significant restoration efforts. Through an extensive ecological assessment, HAI demonstrated to U.S. EPA that the damage resulting from dredging the sediments throughout the wetlands would not benefit the healthy ecosystem present and could result in irreparable harm. U.S. EPA approved an alternate approach proposed by HAI that included dewatering and excavation of the highly contaminated sediments in the upper reaches of the wetlands followed by restoration. Monitoring over the last several years had demonstrated that the wetlands are fully restored. In addition, HAI demonstrated to U.S. EPA, using U.S. EPA's policies, that the sediments could be dewatered and disposed of in a solid waste landfill rather than a TSCA landfill as originally required in the ROD. This resulted in approximately \$750,000 in cost savings.

Rod Negotiations: HAI's pre-design investigation revealed important information that was used to successfully change portions of the ROD, which saved the client an approximate 30 percent savings over the projected life of the cleanup, or roughly \$3,000,000 to \$4,000,000. The following summarizes those changes:

- Based on technical arguments presented by HAI to U.S. EPA, natural attenuation was integrated into ground-water remediation. HAI conducted extensive studies that determined that chlorinated solvents, through natural attenuation, would be reduced to drinking water standards within the time frame stated in the ROD.
- HAI made technical arguments to delete air control equipment from the ground-water stripping unit based on costs, risk-based analyses, and changes in the regulation of certain VOCs formerly considered to be ozone-reactive.

In addition to the ROD changes, U.S. EPA Region I issued an Explanation of Significant Difference (ESD) in response to technical arguments made by HAI, which is one of their first "technical impracticability waivers" for addressing ground water containing DNAPL.

The ESD is expected to result in significant near-term cost savings for the client without compromising protectiveness to human health and the environment.

In-Situ Contaminated Sediment Capping, Superfund Site, U.S. EPA Region IV
HAI developed and conducted an implementability study for using the AquaBlok™ sediment-capping technology to remediate metal-impacted wetland sediments occurring at a Superfund site in U.S. EPA Region IV. Sediment remediation through AquaBlok™ in-situ capping is being proposed as an alternative to the existing ROD remedy for sediment remediation at this site, which generally involves contaminated-sediment removal followed by on-site containment through capping. Elements of the AquaBlok™ implementability study included the following: field characterization of sediments, surface-water hydrology, and vegetation across the site; laboratory characterization of selected sediment samples; completion of pilot-scale, water-column and flume studies focused on simulating on-site cap performance; completion of computer simulations to predict capping effects of on-site hydrology and hydraulics, as well as the potential for cap desiccation; and a systematic comparison of AquaBlok™ and ROD remedies, pursuant to National Contingency Plan criteria. The AquaBlok™ implementability study was submitted to U.S. EPA for their review and comment.

3.7 Other Relevant Project Experience

3.7.1 Examples of Michigan Landfill Experience

Adrian Michigan

Ecological Studies at an Existing Solid Waste Landfill

HAI conducted an in-stream study of population and diversity of indicator species for the entire site to determine if daily landfill operations and remedial activities were adversely affecting the local ecosystem. As untreated discharge from the ground-water purge well system was entering a local river, biological monitoring was conducted, requiring a TI/RE study. The study indicated a need for treatment of the purge water and several benchscale treatability studies that were conducted to assess both chronic and acute toxicity of treated effluent.

Landfill Remediation Study/Closure CQA

HAI completed a remediation study of an existing landfill to determine the area of potential impact on ground water and surface waters. HAI actively assisted in the negotiations of a consent agreement with the State to remediate and upgrade closure of the site concurrent with the design, permitting and construction of a new double composite lined sanitary landfill adjacent to the closing landfill. HAI provided construction bidding and coordination services including on-site monitoring and construction certification of both the closure activities and construction of the new facility. Major remediation and closure components included: installation of a perimeter leachate collection system (3,500 linear feet) through twenty feet of waste under Level B conditions; installation of a perimeter ground-water purge well system with manifolded forcemains and level sensors; on-site treatment of ground water; installation of an active gas collection system with totally enclosed flare; and installation of a composite cap system and surface water control system. The installation of a ground-water recharge

interception system was also completed. The project required approximately 25,000 cubic yards of waste material to be relocated.

As part of the closure activities and permitting of the new facility an ecological study was required to determine what if any effects the landfill activities were having on the ecosystem. HAI conducted an in-stream study of population and diversity of indicator species for the entire site to determine if daily landfill operations and remedial activities were adversely affecting the local ecosystem. As permitted treated discharge from the ground-water purge well system was entering a local river, biological monitoring was conducted, requiring a toxicity identification/reduction evaluation (TI/RE) study. The study indicated a need for additional treatment of the purge water and several benchscale treatability studies were conducted to assess both chronic and acute toxicity of treated effluent. HAI followed through with design and installation of additional treatment facilities which allowed for the continued discharge of the water to the river.

Observation and Construction QA/QC of Landfill Closure, Cap System

HAI provided construction observation and QA/QC services for a composite cap system over an eleven-acre portion of the sanitary landfill. HAI observed and documented the geomembrane installation, and the non-destructive field testing of extrusion and double-wedge fusion welded seams, involving 456,500 square feet of 40 mil VLDPE flexible membrane liner (FML). Field services included geosynthetics laboratory testing, and review of all field and laboratory QA destructive and conformance seam testing results. HAI conducted moisture/density testing of 25,375 cubic yards of compacted soil and observed the placement of 44,370 cubic yards of vegetative soil.

Observation and Construction of QA/QC of Landfill Construction

HAI provided construction observation and QA/QC services for double-composite liner system in four cells totaling approximately thirty-three acres. HAI observed and documented the installation and construction of an underdrain dewatering system, structural fill, secondary and primary clayey soil liners, and secondary and primary 60 mil HDPE liners with leachate collection systems. Field services included moisture/density testing, geosynthetics testing (destructive and non-destructive), and review of all conformance testing. HAI prepared and submitted the certification reports for the individual cells for licensing and operation.

The first cell work was completed under stringent time restraints and in conjunction with the monitoring and certification of extensive ongoing remedial activities at the facility.

Lyon Development Landfill, New Hudson, Michigan

Landfill Operation and Maintenance

HAI assisted with regulatory negotiations, permitting, licensing, budget preparation, engineering support, and construction management from 1982 until closure in 1993. HAI worked with the client and Lyon Township to develop a final use plan. HAI developed an alternate CQA process to allow the use of approximately 150,000 cubic yards of on site soil providing significant cost savings.

Landfill Final Use Plan

HAI developed a final use plan that included the development of a community park over a completed sanitary landfill comprising over 120 acres. A portion of the landfill was

operated in the late 1960s and early 1970s, with the balance being an updated lined landfill with wastes over 100 foot deep. The final use plan (which has been fully implemented) includes tournament softball facilities, little league fields, soccer/softball field, jogging/bicycling trail, and a variety of picnic facilities and supporting utilities.

The project required ongoing interaction with the Lyon Township, the Oakland County Road Commission, the Oakland County Drain Commission, the Michigan Department of Natural Resources (MDNR) and the Federal Aviation Administration (FAA).

Lyon C&C Landfill, Marshall, Michigan

HAI provided a variety of solid waste management services from 4/89 to 7/93, which included upgrading a landfill design to a double-composite liner system, preparing a gas extraction system construction observation document, and developing several surface water and leachate management programs. In addition, HAI provided CQA for various phases of construction. HAI also assisted with permitting and licensing for solid waste disposal.

Coordinated and implemented a special investigation and discharge program for impounded surface water discharge; interacted with the Calhoun County Drain Commission and MDNR; and provided in-house soil and laboratory services.

Landfill Engineering Guidance, Fort Gratiot, Michigan

HAI assisted with facility licensure, developed engineering cost estimates and proformas for permitting and development, provided construction quality assurance services, prepared gas management and closure plans, conducted a geophysical investigation, and coordinated ground-water monitoring for the site. HAI provided engineering support during acquisition/divestiture proceedings in addition to assisting in negotiations with Michigan Department of Environmental Quality regarding site compliance issues and approach to closure.

3.7.2 Projects in Albion

Ground-water Remediation Near City Wellfield, City of Albion, Michigan

HAI conducted a remedial investigation to determine the potential levels of contaminants that could reach the City's wellfield. BTEX concentrations had been detected above applicable standards near the wellfield. As part of the investigation, HAI performed ground-water and solute transport modeling, and ground-water monitoring. Large capacity pumping tests were conducted at 1200 gpm, and were carefully coordinated to avoid any disruption to the City's water supply. In addition, a complex ground-water modeling effort was conducted to determine whether proposed air stripping treatment system emissions would exceed permit requirements.

HAI presented the findings before the City Council and to the PRPs, and prepared a news release on behalf of the City explaining the results of the investigation.

Multiple Phase I Property Assessments, City of Albion, Economic Development Corporation, Michigan

HAI conducted multiple Phase I Property Assessments in accordance with ASTM standards at commercial and industrial properties targeted for redevelopment. The City plans to develop two of the properties, both containing railroad tracks, into a park and roadway. A modified Phase I, which included soil and ground-water sampling was conducted for a proposed eighty-seven acre industrial park.

UST Closure/Remedial Investigation, Albion, Michigan

HAI provided the following services in response to the City's discovery of a leaking UST adjacent to a municipal well field: UST closure, remedial investigation/pilot testing, utilities coordination, remedial design, contractor bid package preparation and oversight, and coordination of public meetings and educational programs.

Following the removal of fuel oil and gasoline storage tanks at the City's street maintenance garage, petroleum releases were identified. Free product removal was conducted with a pneumatic skimming device, augmented by ground-water pumping. Contaminant delineation was initiated through installation of soil borings/monitoring wells and completion of an extensive multi-level soil gas survey. Relatively low-flow pumping tests were conducted in conjunction with a multi-well soil-vapor extraction pilot study to define remedial design parameters. HAI also completed long-duration, high-flow pumping tests at the City's nearby municipal well field to identify potential hydrologic influence on the site. Results of pumping test indicated no connection between the City's wellfield and ground-water contaminants. Remedial design is underway, including the evaluation of risk factors and identification of appropriate criteria for incorporating bioremedial measures.

3.7.3 Environmental Monitoring/Operation and Maintenance General Description

Ground Water Monitoring

Federal, state, and local regulations mandate the implementation of ground-water monitoring programs at solid waste landfill facilities. Regulatory requirements vary from state to state and site to site based on the type of facility, location, or other factors. Standards vary with respect to monitoring system design, sampling and analysis activities, and data evaluations.

The basis of ground-water monitoring programs include establishing a baseline, evaluating and selecting a monitoring program, investigating potential ground-water contamination using statistical and hydrogeochemical methods, assessing the rate and extent of a plume or constituents (if a release has occurred), and evaluating corrective measures based on risk reduction and cost benefit analyses.

HAI applies an integrated approach to obtaining validated data and regularly audits analytical laboratories to maintain a level of confidence regarding quality control. We have coordinated with analytical laboratories to provide electronic data transfer interfaces which has resulted in less data handling, increased data validation, and substantial reduction in cost associated with data management and analysis.

HAI has assembled a multi-disciplinary team of professionals to establish and maintain effective ground-water monitoring programs including geologists, hydrogeologists, geochemists, environmental scientists, biologists, statisticians, environmental engineers, and environmental technicians. Our staff of scientists and engineers maintain professional certificates in many states, actively participate in professional organizations, publish and speak publicly on a variety of technical issues, and monitor and comment on regulations and policy issues.

Areas of expertise for the ground-water monitoring team include permitting and negotiations, sampling and analysis plan development and implementation, database design and management, statistical and geochemical evaluations, ground water flow and fate and transport modeling, remedial investigations, corrective measures, economic analyses, risk assessment, and laboratory audits.

Storm and Surface Water Control

The Federal Clean Water Act of 1977 mandates that waters of the United States be protected from industrial discharges. Facilities with discharges are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit. Various types of permits are available based on the nature of the discharge, type of industry, or process from which the discharge is derived. Specific permit requirements may include developing pollution prevention plans to prevent/minimize discharged pollutants; identifying and evaluating toxicity to ensure that the discharge does not adversely impact the surface water body; completing anti-degradation demonstrations to evaluate other discharge options that may have less impact; and conducting in-stream studies to determine actual impact from the facility to the local ecosystem.

HAI assists with the following:

- Permit Negotiations and Management
- Monthly Reports
- Storm Water Management Model (SWMM)
- Hydraulic Engineering Center River Analysis System (HEC-RAS)
- Pollution Prevention Plans
- Biomonitoring
- n-Stream Studies
- Anti-Degradation Demonstrations

HAI's experienced staff of environmental scientists, biologists, hydrogeologists, and engineers understand storm and surface water regulations and keep our clients informed of the applicability of these regulations to their operations. The HAI team of professionals assists many clients in obtaining the appropriate permit for the type of water being managed. HAI works with appropriate agencies to negotiate permit conditions and approvals, completes required reporting submittals, develops storm water pollution prevention plans for construction and industrial activities, completes biomonitoring and in-stream studies, and maintains professional certifications required in various states.

Landfill Gas Monitoring

HAI has prepared numerous Explosive Gas Monitoring Plans (EGMP) for solid waste landfills. Our monitoring system designs include the evaluation of often complex hydrogeologic conditions, consideration of the system's potential impact on site access and construction, identification of the need for automated alarm technologies, and training for monitoring and reporting. We have designed and installed many gas monitoring systems at sites, including passive venting and active collection. HAI has employed gas migration cutoff systems both as a means of addressing risk of lateral movement through unsaturated soils and protecting ground water quality outside the limits of waste.

As an adjunct to our explosive gas services, HAI conducts New Source Performance Standards (NSPS) and Emissions Guidelines (EG), Tier 1 Non-Methanogenic Organic Compounds (NMOC) modeling, Tier 2 sampling and modeling, and Tier 3 testing. NSPS/EG modeling efforts identified the need to install gas collection systems at several landfills to ensure compliance. HAI also conducts sampling and emissions modeling of Volatile Organic Compounds (VOCs), Hazardous Air Pollutants (HAPs), particulates, methanogenic compounds, etc. Finally, HAI completes gas-to-energy feasibility studies, preliminary financial analyses of the economic viability of such plans, and technical evaluations for implementing beneficial reuse of landfill gas.

HAI engineers have extensive experience in comprehensive air modeling, permit application preparation, and negotiation services, including electronic submittals of Clean Air Act Title V permit applications for landfills. Permits for landfills can involve several contributing emission sources including fugitive dust, leachate evaporators, flares, asbestos containing materials, combustion engines, and fuel tanks.

Landfill Construction, Permitting and Operation

HAI's involvement with landfill facilities includes assistance with day to day operations in the active phase of the landfill and extends into closure, post closure, and final use. Our familiarity and involvement with a site during the operation of the facility allows us to assist better with the closure and post closure care of the landfill. Our wide range of experience with both large and small, public and private facilities also makes us capable of assuming engineering service responsibilities during all phases of a facility.

- License Alterations/Modification
- Operational Compliance
- Annual Reports/Operating Records
- Construction Plans & Bid Documents
- Contractor Solicitation
- Construction Observation/Contract Administration
- Construction Quality Assurance
- Construction Documentation/Certification
- Post Closure Monitoring/Inspections

Our familiarity with landfill design, permitting, construction management, rate studies, operation, and closure activities allows HAI to assist at any time during the active life, closure, or post closure care of the facility. During the active life we are able to

efficiently carry out or manage projects, including leachate management, new cell construction, and closure projects. Services associated with closure construction include construction plans, bid documents, solicitation of contractors, construction observation, construction quality assurance (CQA), construction quality control (CQC), and certification report preparation.

We also prepare and assist with implementation of post-closure monitoring for ground water, surface water, explosive gas, surface water and leachate collection systems, as well as periodic inspections of the closed facility. HAI works with the site throughout closure activities to minimize long-term maintenance and monitoring costs for the facility.

HAI's civil and geotechnical engineering background coupled with geologists/hydrogeologists, environmental scientists, and other environmental experts provide a complete team for landfill closure work.

3.7.3.1 Environmental Monitoring/Operation and Maintenance Project Examples **Ground Water Monitoring, Hydrogeologic Investigation and Engineering Services, Geneva, Ohio**

HAI manages the facility's ground water monitoring program, coordinates sampling activities between client and laboratory, prepared the facility sampling and analysis plan and statistical monitoring plan revisions, conducted hydrologic and geochemical data evaluations (including RCRA statistics), and ensures compliance with applicable regulatory programs. As part of the ground water monitoring program, HAI made successful demonstrations to Ohio EPA to verify false calculated statistical positive for selected ground-water parameters allowing the facility to remain in detection monitoring and avoid costly assessment activities. HAI also successfully negotiated with Ohio EPA to minimize the number of ground water wells required for the ground water monitoring program. HAI has also assisted with leachate management evaluations, stormwater pollution prevention planning, waste characterization, and other environmental monitoring programs.

USA Wastes

Environmental Monitoring at the City of Toledo, Hoffman Road Landfill

HAI assisted the City of Toledo in all aspects of environmental compliance associated with ground-water monitoring, including preparation and implementation of a detection monitoring sampling and analysis plan to bring the facility into compliance with the OAC regulations as effective June 1, 1994. HAI negotiated with Ohio EPA on behalf of the City, completed technical evaluations to support City's position. Negotiations resulted in reductions of fines assessed to City allowances to reallocate fine money towards other City programs and established actions levels to eliminate need for assessment activities. Findings and Orders issued by Ohio EPA's director provided a reasonable approach for the City to maintain compliance in a timely manner while not burdening their limited financial resources.

HAI completed a detailed review of all available hydrogeologic information available for the facility to assist in the development of a state-of-the-art ground-water monitor well network. In addition, HAI completed a comprehensive monitor well field evaluation to determine the yield characteristics of each monitor well installed in three water-bearing

zones at the facility. As a result of this investigation, HAI assisted the City of Toledo in reducing the current ground-water monitor well network, resulting in significant cost savings to the City.

HAI has completed monitor well installation activities, developed a bid package and assisted in the selection of the analytical laboratory, managed the large database of ground-water quality data associated with three water-bearing zones, completed field sampling team during sample collection, and developed Reports of Ground-water Quality consistent with the OAC Regulations.

HAI has developed a conceptual model for a MSWL using hydrogeologic, geochemical, mineralogical, and climatological data to simulate precipitation infiltration and subsequent chemical reaction pathways. The objective of this model is to serve as a tool to demonstrate the expected geochemical results of a leachate release in lieu of statistically evaluating ground-water quality data where limitations in the methodology often results in "false positive" triggers.

Environmental Monitoring at the Wood County, Ohio Landfill

Ground-water monitoring at the Wood County Landfill has been completed in a similar manner to the previous facilities, and includes: regulatory review; preparation of ground-water sampling and analysis plans; sample preparation, collection, documentation; and data entry/reduction and statistical analysis. HAI has managed the Wood County Landfill ground-water program through two different changes in the applicable regulations, collecting and/or analyzing twenty sets of analytical data over six years. HAI successfully demonstrated that the elevated concentration of one parameter was the result of the suspended solids in the sample, and not due to activities at the facility. HAI also assisted the Wood County Landfill in preparing a bid package for field and laboratory services and reviewed these packages to make a recommendation that would assist the County in awarding the contract.

In addition to sampling and analysis plans, HAI has assisted in the development of a hydrogeological and ground-water monitoring plan, certified the ground-water detection sampling and analysis plan and completed a closure plan and economic analysis for post-closure monitoring. HAI has assisted the Wood County Landfill in minimizing the number of wells required to be monitored, collected and analyzed data to fill in gaps, assisted in bidding and oversight for drilling services, assisted in landfill expansion, and collected the necessary information to prepare the annual report for submittal to the regulatory agency. HAI has also assisted the Wood County Landfill in public relations and a number of other environmental monitoring programs including, but not limited to: leachate monitoring; storm water/NPDES monitoring; and methane gas monitoring; as well as compliance with Operating Record indexing and reporting criteria.

HAI prepared a solid waste management district plan for Wood County and is assisting Wood County with plan implementation. As part of the preparation of the Wood County District Plan, HAI evaluated county-wide waste generation and completed characterization activities for preparation of a general district solid waste management plan. Activities included identifying and completing preliminary assessments of abandoned dumps and active landfills within the county and involved close coordination with local, county, and state government representatives.

Environmental Monitoring at the City of St. Marys, Ohio Landfill

HAI has assisted the St. Marys Landfill in all aspects of environmental compliance associated with ground-water monitoring. HAI has prepared a detection monitoring sampling and analysis plan and numerous other plans required as part of the overall operation of the facility. Prior to the new OAC regulations taking effect and during HAI's assistance in a bid package preparation for laboratory analytical services, HAI incorporated additional parameters in the bid package, in anticipation of a regulatory change, and were able to lock in lower analytical costs for the ground-water monitoring program that was implemented a year later. HAI has managed the St. Marys Landfill ground-water program through two different changes in the applicable regulations, and in addition to developing sampling and analysis plans, has assisted in the development of a hydrogeological and a ground-water monitoring plan, certified the ground-water detection sampling and analysis plan, and completed a closure plan and economic analysis for post-closure monitoring. HAI has assisted the St. Marys Landfill in minimizing the number of wells to be monitored, collected and analyzed data to fill in gaps, assisted in bidding and oversight for drilling services, assisted in landfill expansion activities, and collected the necessary information to prepare the annual report for submittal to the regulatory agency. HAI has also assisted the St. Marys Landfill in public relations and a number of other environmental monitoring programs including, but not limited to: leachate monitoring; storm water/NPDES monitoring; and methane gas monitoring; as well as compliance with Operating Record indexing and reporting criteria.

In addition to the above, HAI is assisting the City of St. Marys in completing ground-water quality assessment monitoring activities consistent with the OAC regulations. Activities completed to date include the installation of a ground-water quality assessment monitor well network, completion of several ground-water assessment sampling events, development of status reports, and a preliminary evaluation of analytical results associated with the first year of the program. Additional activities to be completed at the facility will include installation of additional monitor wells, completion of ground-water assessment sampling events, and development of reports presenting the results of the investigation.

Environmental Monitoring at Hardin County, Ohio Landfill

HAI completed a detailed review of the ground-water monitoring program associated with the Hardin County Landfill to identify long-term cost savings to the County, while maintaining compliance with the appropriate federal and state regulations. The initial step in the project consisted of completing a detailed review of background information associated with the facility, including files maintained by the Ohio EPA. The review consisted of evaluating ground-water monitoring and assessment plans, sampling and analysis plans, reports of ground-water quality, and other sources of geologic/hydrogeologic information developed by various consultants to aid HAI in obtaining a thorough understanding of the facility's ground-water monitoring program.

Realizing that there are a variety of ground-water monitoring scenarios under which a facility may achieve considerable cost savings over the long-term, HAI proposed recommendations as to modifications which could potentially limit long-term expenses associated with the monitoring program. Recommendations consisted of proposing modifications to the ground-water monitor well network and determining alternative sampling and analysis activities.

HAI assisted the facility in the development of a detection monitoring sampling and analysis plan to comply with the applicable ground-water regulations, and is currently completing field sampling and analysis, data management, and data interpretation activities for the facility. HAI is also in the process of completing a ground-water quality assessment monitoring program and developing a corrective measures program at the facility to comply with the applicable regulations.

Site Management Activities/Leachate Analysis, Confidential Client, Ohio

HAI is the lead contractor to conduct site management work for a former manufacturing site. HAI is tracking compliance; monitoring the facilities and systems, including sampling discharges to a river and sewer system; arranging maintenance when required; and providing monthly and quarterly updates to the client with recommendations for site condition improvements to minimize leachate.

HAI is closely monitoring the leachate concentrations being collected and discharged to a sanitary sewer. HAI is reviewing the existing methods of measuring leachate being pumped to the sanitary sewer system and will provide recommendations to the client regarding the suitability of existing flow measuring equipment, alternative equipment, and calibration methods and frequencies. This activity will ensure that accurate flow measurements are being provided to the treatment plant for compliance/billing purposes.

3.7.4 Corrective Measures Project Examples

Hydrogeologic Investigation for a State Listed Priority Cleanup Site, Northeast Ohio

In response to Findings and Orders issued jointly by the Ohio EPA and the Ohio Bureau of Underground Storage Tank Regulations (BUSTR), HAI has been retained by five entities to initially characterize a contaminated aquifer. The work required close coordination with Ohio EPA Northeast District Office. The objectives of the project are to identify the areas which may have released contaminants to the ground water, identify contaminant patterns, and evaluate potential source removal actions or other appropriate interim actions to mitigate immediate and substantial threats. As part of the project, HAI developed a work plan, health and safety plan, and field sampling and analysis plan.

Landfill Corrective Measure Study, Southwest Ohio

A Corrective Measure Study of an active landfill was developed to determine a preferred remedial alternative to address leachate-derived constituents discharging to ground water and an exceptional warm surface water. Ground-water assessments at the facility had identified various volatile organic compounds and metals (including arsenic) in ground water at the margin of solid waste placement, and had identified a nearby stream as the point of discharge of contaminated ground water. The stream had been designated by Ohio EPA as an "exceptional warm water environment" its most protected category. Further, ground water near the facility was used for residential supply.

HAI evaluated several corrective measures intended to manage and restore contaminated media at the site, including the use of passive flow controls such as slurry

walls, active ground-water extraction, and various combinations of active and passive mechanisms. Based on computer simulation of ground-water flow and the effects of the various corrective measures, HAI recommended active ground-water extraction and treatment. HAI based its selection on a performance evaluation, and evaluation of human health risks intended use of ground water near the site, and on an assessment of the ecological impacts associated with the continued discharge of ground-water to surface waters.